Doc. No. 78-2564-01

Installing the RSP7000 Upgrade Kit in the Cisco 7000 Series Routers

Product Number UPG-RSP7000=

This document contains instructions for installing the 7000 Series Route Switch Processor (RSP7000) upgrade kit (UPG-RSP7000=) in the Cisco 7000 series routers: Cisco 7000 and Cisco 7010. This upgrade kit allows for 7500-series performance enhancements to the Cisco 7000 series routers. The RSP7000 upgrade kit includes the following components:

- The 7000 Series Route Switch Processor (RSP7000) board, which installs *only* in the 7000 RSP slot—slot 5 in the Cisco 7000, and slot 3 in the Cisco 7010
- The 7000 Series Chassis Interface (RSP7000CI) board, which installs *only* in the 7000 CI slot—slot 6 in the Cisco 7000, and slot 4 in the Cisco 7010

The RSP7000 upgrade kit requires that your Cisco 7000 series router is running Cisco Internetwork Operating System (Cisco IOS) Release 10.3(9), or later, Release 11.0(6), or later, or Release 11.1(1) or later.

Caution Using the RSP7000 upgrade kit in your Cisco 7000 series router might require that some currently installed interface processors be upgraded to specific, compatible hardware versions; *otherwise, error messages and erratic system behavior might result.*You can use the **show diag** command to see which interface processors in your system need this hardware upgrade. For a complete list of the potentially affected interface processors, their required hardware versions, and information on upgrading your affected interface processors, refer to the document *Verifying Interface Processor Compatibility with the Cisco 7500 Series Investment Protection Program (IPP)*, Document Number 78-2077-xx, where xx refers to the latest version of this document.

The sections in this document include the following:

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- Installation Prerequisites, page 6
- Installing the RSP7000 Upgrade Kit, page 16
- Checking the Installation, page 21
- Customer Information Online, page 26

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Product Overview

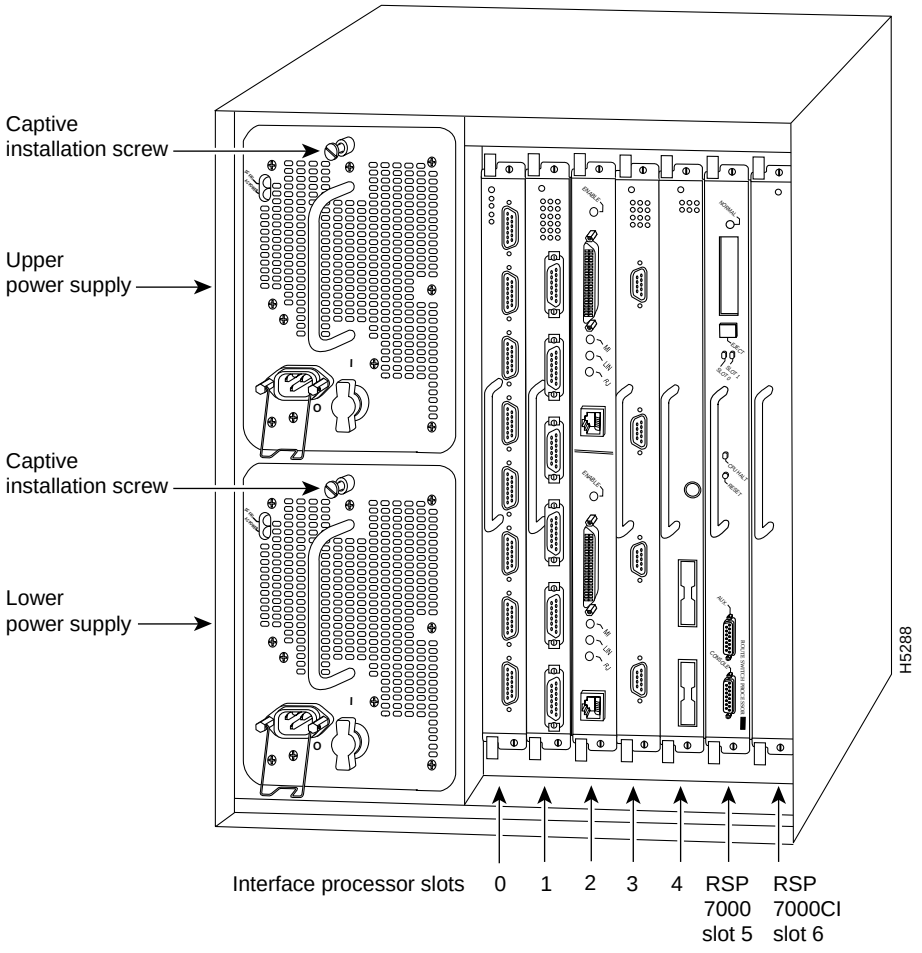
Following are brief descriptions of the Cisco 7000 and Cisco 7010 routers, the RSP7000, and the RSP7000CI.

What Is the Cisco 7000?

The Cisco 7000 is a seven-slot router chassis, which uses the new RSP7000. The Cisco 7000 provides up to five interface processor slots, and can accommodate the following CxBus-based interface processors: Fast Ethernet, Ethernet, Token Ring, Fiber Distributed Data Interface (FDDI), channel attachment, multichannel, serial, and so forth. The 7000 RSP and interface processors are keyed with guides on the backplane to prevent them from being fully inserted in the wrong slot.

Figure 1 shows the rear of the Cisco 7000 router with the RSP7000 and RSP7000CI installed. In the Cisco 7000 series, two slots are reserved for the 7000 Route Switch Processor (RSP7000), which contains the system processor and performs packet switching functions, and the 7000 Chassis Interface (RSP7000CI) board, which contains all of the environmental monitoring functions for the Cisco 7000, when configured with the new 7000 RSP. The remaining slots (0 through 4) are for interface processor.

Figure 1 Cisco 7000 with RSP7000 and RSP7000CI Installed

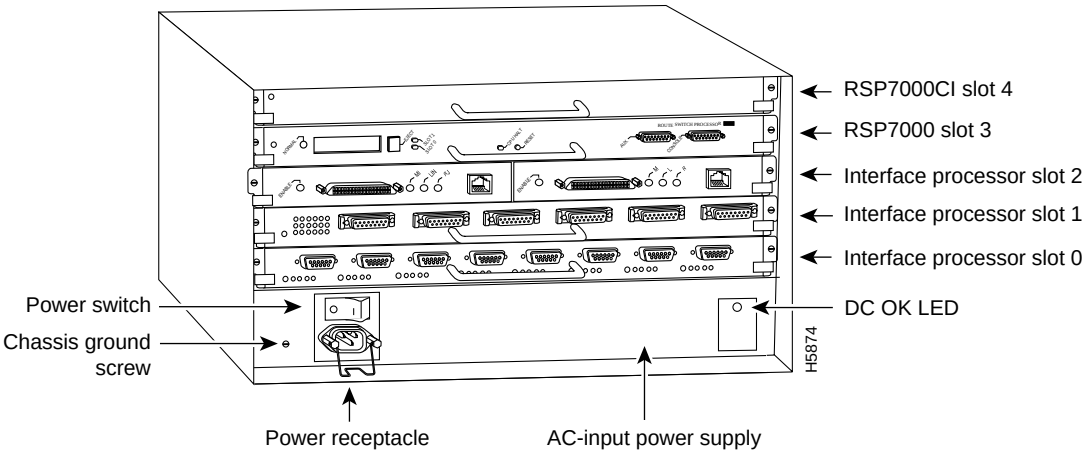


What Is the Cisco 7010?

The Cisco 7010 is a five-slot chassis, which uses the new RSP7000 (and the RSP7000CI), and provides up to three interface processor slots that can accommodate the following CxBus-based interface processors: Fast Ethernet, Ethernet, Token Ring, Fiber Distributed Data Interface (FDDI), channel attachment, multichannel, serial, and so forth. The processor and interface processors are keyed with guides on the backplane to prevent them from being fully inserted in the wrong slot.

Figure 2 shows the rear of the Cisco 7010 router with the RSP7000 and RSP7000CI installed. In the Cisco 7010, slots 3 and 4 are reserved for the RSP7000, which contains the system processor and performs packet switching functions, and the RSP7000CI board, which contains all of the environmental monitoring functions for the Cisco 7010. The remaining three slots (slots 0 through 2) are for interface processors.

Figure 2 Cisco 7010 with RSP7000 and RSP7000CI Installed



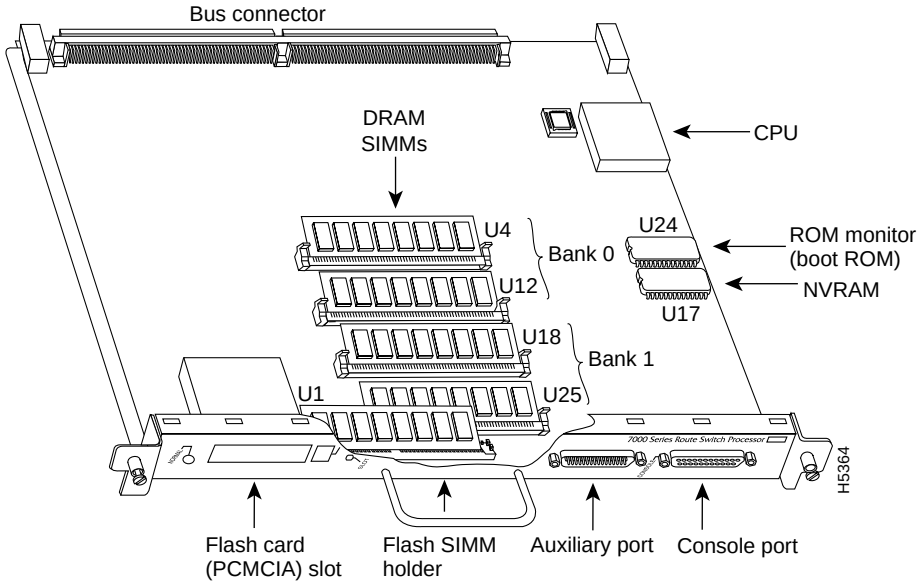
What Is the RSP7000?

The RSP7000 is a new main system processor module for the Cisco 7000 series chassis. It combines all of the switched routing and high-speed switching functions of the separate Route Processor (RP) and Switch Processor (SP), which are used in the Cisco 7000 series routers, but with improved performance on a single processor module. The RSP7000 contains the central processing unit (CPU) and most of the memory components for the Cisco 7000 series chassis.

Caution To prevent damage to the chassis slot and to the connector on the RSP7000, do not attempt to install the RSP7000 in any other slot but the chassis' 7000 RSP slot. *Do not install the RSP7000 in the router's Route Processor (RP) slot*. You must install the RSP7000 in the appropriate chassis' 7000 RSP slot. (See Figure 1 on page 2, for the Cisco 7000, or Figure 2 on page 3 for the Cisco 7010.)

Note For the appropriate Cisco IOS version required for the RSP7000, refer to the section "Software Prerequisites" on page 7.

Figure 3 RSP7000



Caution To prevent system problems, the RSP7000 must *not* be removed or installed with power ON to the chassis. The RSP7000 does not support online insertion and removal (OIR).

What is the RSP7000CI?

The RSP7000CI, shown in Figure 4, consists of a printed circuit board attached to a metal carrier. The RSP7000CI has no user-configurable jumpers or switches, and its faceplate contains no LEDs. The RSP7000CI is distinguishable only by the label on its faceplate, which reads *7000 Series Chassis Interface*. (See Figure 4.) The RSP7000CI provides the environmental monitoring and power supply monitoring functions for the Cisco 7000 series chassis. The RSP7000CI isolates the CPU and system software from chassis-specific variations.

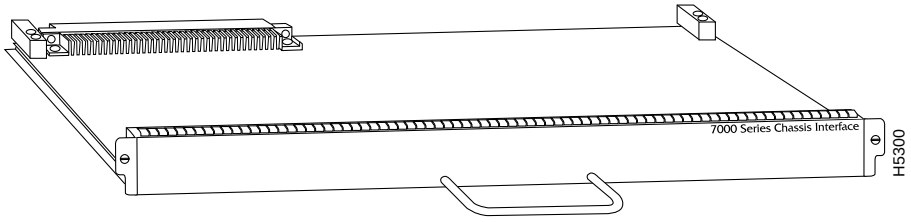
Caution To prevent system problems, the RSP7000CI must *not* be removed or installed with power ON to the chassis. The RSP7000CI does not support online insertion and removal (OIR). You must install the RSP7000CI in the appropriate chassis' 7000 CI slot. (See Figure 1 on page 2, for the Cisco 7000, or Figure 2 on page 3 for the Cisco 7010.)

Note For the appropriate Cisco IOS version required for the RSP7000CI, refer to the section "Software Prerequisites" on page 7.

The functions of the RSP7000CI are as follows:

- Report backplane type
- Report arbiter type
- Monitor power supply status
- Monitor fan/blower status
- Monitor temperature sensors on the RSP7000
- Provide router power up/down control
- Provide power supply power-down control

Figure 4 RSP7000CI



Installation Prerequisites

Before you begin this installation, review the safety guidelines in this section to avoid injuring yourself or damaging the processor module.

Safety Guidelines

Following are safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds; correct all hazardous conditions.

Telephone Wiring Guidelines

Use the following guidelines when working with any equipment that is connected to telephone wiring or to other network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations, and use caution when installing or modifying telephone lines.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Use a preventive antistatic strap whenever handling a processor module.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact.
- Connect the equipment end of the strap to a captive installation screw on an installed power supply.
- Handle components by the edges only; avoid touching the board or connectors.

- Place a removed component on an antistatic surface or in a static shielding bag. If you plan to return the component to the factory, immediately place it in a static shielding bag.
- Avoid contact between the component and clothing. The wrist strap only protects the board from ESD voltages on the body; ESD voltages on clothing can still cause damage.

Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms.

Software Prerequisites

The RSP7000 upgrade kit requires that your Cisco 7000 series router is running Cisco Internetwork Operating System (Cisco IOS) Release 10.3(9), or later, Release 11.0(6), or later, or Release 11.1(1) or later.

The **show version** and **show hardware** commands display the current hardware configuration of the router, including the system software version that is currently loaded and running. The **show microcode** command lists the bundled microcode (target hardware) version for each processor type. The **show controller cbus** command shows the microcode version you are running. (For complete descriptions of **show** commands, refer to the *Router Products Configuration Guide* and *Router Products Command Reference* publications.)

You can determine the current version of software or microcode stored in ROM either by removing the processor module and checking the ROM labels or by configuring the system to boot the system software or microcode from ROM, reloading the system, and using **show** commands to check the version that is loaded and running. Refer to the appropriate software documentation for complete configuration instructions and examples.

If the displays indicate that the required system software and microcode is not available in your system, contact a customer service representative for upgrade information. (Refer to the section "Customer Information Online" at the end of this document.)

Hardware Prerequisites

You must install the RSP7000 in the appropriate chassis' 7000 RSP slot. (See Figure 1, on page 2, for the Cisco 7000, or Figure 2, on page 3, for the Cisco 7010.) For the RSP7000 to operate properly, the Cisco 7000 and Cisco 7010 chassis must also be configured with the RSP7000CI.

List of Tools and Parts

Following are the tools and equipment that you will need to complete this replacement:

- ESD-prevention equipment (a disposable wrist strap is included with all spares and upgrade kits)
- Antistatic mat, foam pad, or bags for the removed RP and SP (or SSP) (Immediately place all removed boards into antistatic bags if you plan to return them to the factory.)
- Number 2 Phillips or 3/16-inch flat-blade screwdriver to loosen the processor module captive installation screws, and replace the RP and SP (or SSP) with the RSP7000 and RSP7000CI boards
- The RSP7000 upgrade kit, which includes the RSP7000 and the RSP7000CI

Flash Memory Card Replacement and Formatting Prerequisites

If you have a Flash memory card installed in the PCMCIA slot of your RP, you must reformat it if you want to use it with your new RSP7000. Using the RSP7000, you cannot read data on the RP's Flash memory card, nor can you use it as bootable media. You must reformat the RP's Flash card before you can use it with the RSP7000. Flash memory cards formatted on the RP-based systems (7000 series routers) are formatted differently from Flash memory cards formatted on RSP-based systems (7500 series routers).

Caution The formatting procedure erases all information on the Flash memory card. To prevent the loss of important data that might be stored on a Flash memory card, proceed carefully. If you want to save the data on a Flash memory card, copy the data to a server before you format the card.

Note Refer to the section "Uploading (Copying) the Configuration File," on page 12, and then the section "Downloading (Retrieving) the Configuration File," on page 14.

Overview of Processor Module Replacement

When you remove or install a processor module, be sure to use the ejector levers, which help to ensure that the processor module is fully inserted in the backplane or fully dislodged from it. Any processor module that is only partially connected to the backplane can halt the system.

Figure 5 on page 9 shows a detail of the ejector lever mechanism in a vertical position that is appropriate for the Cisco 7000. The processor module slots in the Cisco 7010 are oriented horizontally. When you simultaneously push the ejector levers inward (toward the carrier handle), the levers push the processor into the slot and ensure that the board connectors are fully seated in the backplane.

In the Cisco 7000, the RSP7000 *must* be installed in the 7000 RSP slot (slot 5) and the RSP7000CI must be installed in the 7000 CI slot (slot 6). In the Cisco 7010, the RSP7000 *must* be installed in the 7000 RSP slot (slot 3) and the RSP7000CI must be installed in the 7000 CI slot (slot 4).

Note Figure 5 shows a typical processor module installation in a Cisco 7000, and is not intended to indicate or recommend a particular slot location for the RSP7000 or the RSP7000CI. The processor module slots in the Cisco 7010 are oriented horizontally (see Figure 7), but the function of the captive installation screws and ejector levers is identical.

Figure 5 Ejector Levers and Captive Installation Screw

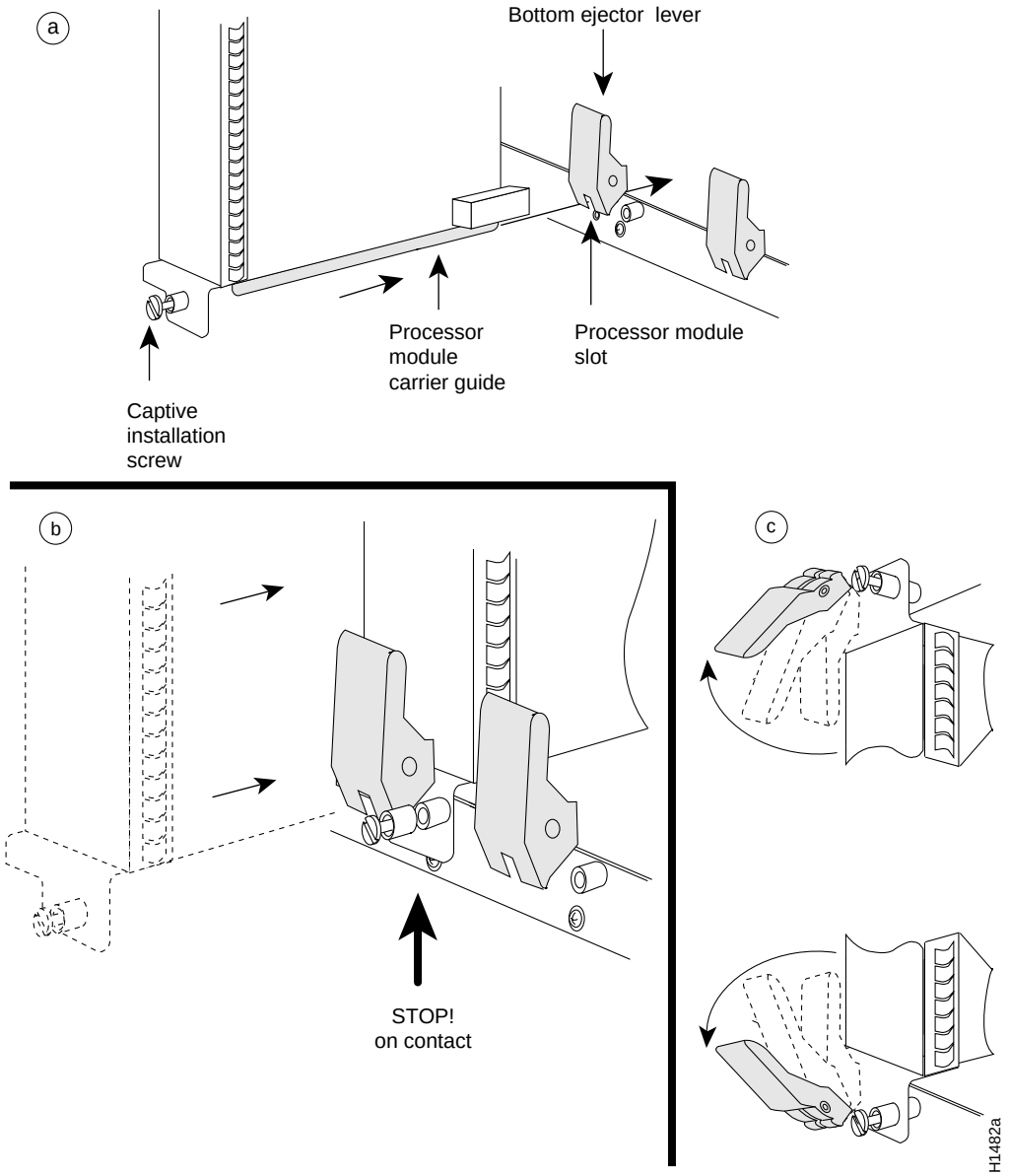


Figure 6 shows how to orient a card for installation in the Cisco 7000. During installation, refer to this illustration if you have a Cisco 7000.

Figure 6 Card-Installation Orientation in the Cisco 7000

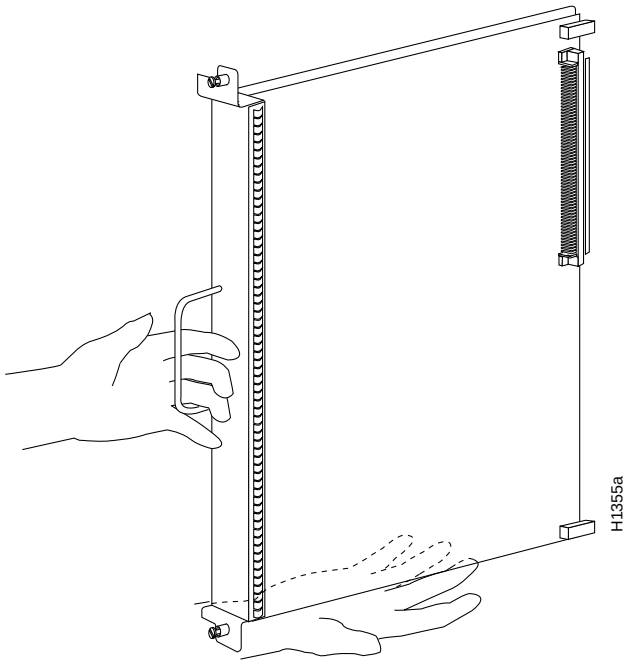
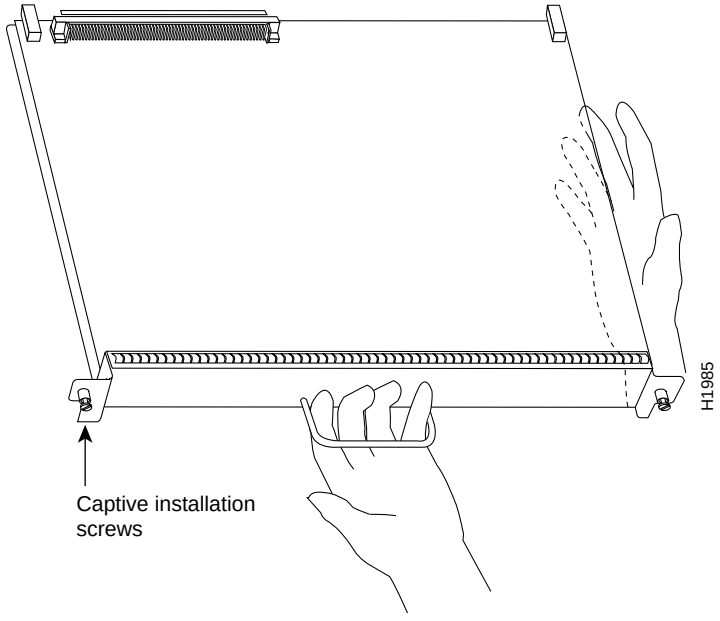


Figure 7 shows how to orient a card for installation in the Cisco 7010. During installation, refer to this illustration if you have a Cisco 7010.

Figure 7 Card-Installation Orientation in the Cisco 7010



Saving and Retrieving the Configuration File

This section describes the procedures for saving and retrieving the system configuration. Configuration information resides in two places when the router is operating: the default (permanent) configuration in NVRAM, and the running (temporary) memory in RAM. The default configuration always remains available; NVRAM retains the information even when the power is shut down. The current information is lost when if the system power is shut down. The current configuration contains all nondefault configuration information that you added with the **configure** command, the **setup** command facility, or by editing the configuration file.

The **copy running-config startup-config** command adds the current configuration to the default configuration in NVRAM, so that it will also be saved when power is shut down. Whenever you make changes to the system configuration, issue the **copy running-config startup-config** command to ensure that the new configuration is saved.

If you replace the RSP7000, you will also replace the entire configuration (NVRAM resides in socket U17 on the RSP7000). If you upload (copy) the configuration file to a remote server before removing the RSP7000, you can retrieve it later and write it into NVRAM on the new RSP7000. If you do not upload the configuration file, you will have to use the **configure** command or the **setup** command facility to reenter the configuration information after you install the new RSP7000. For complete descriptions of these commands and instructions for using them, refer to the appropriate software documentation.

This procedure is not necessary if you are temporarily removing an RSP7000 that you will reinstall; the lithium batteries will retain the configuration in memory until you replace the RSP7000 in the system.

This procedure requires privileged-level access to the EXEC command interpreter, which usually requires a password. Refer to the description that follows and contact your system administrator if necessary, to obtain access.

Using the EXEC Command Interpreter

Before you use the **configure** command, you must enter the privileged level of the EXEC command interpreter with the **enable** command. The system prompts you for a password if one has been set.

The system prompt for the privileged level ends with a pound sign (#) instead of an angle bracket (>). At the console terminal, enter the privileged level as follows:

Step 1 At the user-level EXEC prompt (>), enter the **enable** command. The EXEC command interpreter prompts you for a privileged-level password, as follows:

```
Router> enable

Password:
```

Step 2 Enter the password (the password is case sensitive). For security purposes, the password is not displayed.

Step 3 When you enter the correct password, the system displays the privileged-level system prompt (#) as follows:

```
Router#
```

The pound sign (#) at the system prompt indicates that you are at the privileged level of the EXEC command interpreter; you can now execute the EXEC-level commands that are described in the following sections.

Using the Ping Command

Before you attempt to upload or retrieve a file from a remote host, ensure that the connection is good between the router and the remote server. The *packet internet groper* (ping) program sends a series of echo request packets to the remote device and waits for a reply. If the connection is good, the remote device echoes them back to the local device.

The console terminal displays the results of each message sent: an exclamation point (!) indicates that the local device received an echo, and a period (.) indicates that the server timed out while awaiting the reply. If the connection between the two devices is good, the system will display a series of exclamation points (! ! !) or [ok]. If the connection fails, the system will display a series of periods (. . .) or [timed out] or [failed].

To verify the connection between the router and a remote host, issue the **ping** command followed by the name or Internet Protocol (IP) address of the remote server, then press **Return**. Although the **ping** command supports configurable options, the defaults, including interface processor as the protocol, are enabled when you enter a host name or address on the same line as the **ping** command. For a description of the configurable options, refer to the appropriate software documentation.

The following example shows a successful ping:

```
Router# ping 1.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 12/12/12 ms
Router#
```

The following example shows the results of a failed ping:

```
Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
Router#
```

If the connection fails, check the physical connection to the remote file server and verify that you are using the correct address or name, then ping the server again. If you are unable to establish a good connection, contact your network administrator or refer to the end of this document for instructions on contacting technical assistance.

Uploading (Copying) the Configuration File

Before you remove the RP and replace it with the RSP7000, you should upload the router's configuration file to a Trivial File Transfer Protocol (TFTP) file server, or else the configuration stored in the RP's Flash memory will be lost when you replace it. Before you upload (copy) the running configuration to the TFTP file server, ensure the following:

- You have a connection to the router either with a console terminal connected to the RP console port, or remotely through a Telnet session.
- The router is connected to a network supporting a file server (remote host).
- The remote host supports the TFTP application.
- You have the interface processor address or name of the remote host available.

To store information on a remote host, enter the **write network** (or **copy startup-config tftp**) privileged EXEC command. The command prompts you for the destination host's address and a filename, then display the instructions for confirmation. When you confirm the instructions, the router sends a copy of the currently running configuration to the remote host. The system default is to store the configuration in a file called by the name of the router with *-confg* appended. You can either accept the default filename by pressing **Return** at the prompt, or enter a different name before pressing **Return**.

Follow these steps to upload (copy) the currently running configuration to a remote host:

Step 1 The system prompt should display a pound sign (#) to indicate the privileged level of the EXEC command interpreter. If it does not, enter **enable**, and then your password, to get to the privileged level of the EXEC command interpreter.

Step 2 Use the **ping** command to check the connection between the router and the remote host.

Step 3 Issue the **write term** (or **show running-config**) command to display the currently running configuration on the terminal, and ensure that the configuration information is complete and correct. If it is not, use the **configure** command to add or modify the existing configuration. Then, issue the **copy running-config startup-config** command to save the retrieved configuration in NVRAM. (Refer to the appropriate software documentation for descriptions of the configuration options available for the system and individual interfaces, and for specific configuration instructions.)

Step 4 Issue the **write net** (or **copy startup-config tftp**) command. The EXEC command interpreter prompts you for the name or interface processor address of the remote host that is to receive the configuration file. (The prompt might include the name or address of a default file server.)

```
Router# write net
Remote host []?
```

Step 5 Enter the name or interface processor address of the remote host. In the following example, the name of the remote server is *servername*:

```
Router# write net
Remote host []? servername
Translating "servername"...domain server (1.1.1.1) [OK]
```

Step 6 The EXEC command interpreter prompts you for the name of the file that will contain the configuration. By default, the system appends *-confg* to the router's name to create the new filename. Press **Return** to accept the default filename, or enter a different name for the file before pressing **Return**. In the following example, the default is accepted:

```
Name of configuration file to write [Router-confg]?
Write file Router-confg on host 1.1.1.1? [confirm]
Writing Router-confg .....
```

Step 7 Before the router executes the copy process, it displays the instructions you entered for confirmation. If the instructions are not correct, enter **n** (no) then **Return** to abort the process. To accept the instructions, press **Return** or **y** then **Return**, and the system will begin the copy process. In the following example, the default is accepted:

```
Write file Router-confg on host 1.1.1.1? [confirm]
Writing Router-confg: !!!! [ok]
```

While the router copies the configuration to the remote host, it displays a series of exclamation points (! ! !) or periods (. . .). The !!!! and [ok] indicate that the operation is successful. A display of . . . [timed out] or [failed] indicates a failure, which would probably be due to a network fault or the lack of a writable, readable file on the remote file server.

Step 8 If the display indicates that the process was successful (with the series of ! ! ! and [ok]), the upload process is complete. The configuration is safely stored in the temporary file on the remote file server.

If the display indicates that the process failed (with the series of . . . as shown in the following example):

```
Writing Router-confg .....
```

your configuration was not saved. Repeat the preceding steps, or select a different remote file server and repeat the preceding steps.

After you upload the configuration file, proceed to "Removing the RP" on page 17. If you are unable to copy the configuration to a remote host successfully, contact your network administrator or refer to the end of this document for instructions on contacting technical assistance.

Downloading (Retrieving) the Configuration File

After you install the new RSP7000, you can retrieve the saved configuration and copy it to NVRAM. To retrieve the configuration, enter configuration mode and specify that you will configure the router from the network. The system prompts you for a host name and address, the name of the configuration file stored on the host, and confirmation to reboot using the remote file.

You can access the router through a console terminal attached directly to the RSP7000 console port, or you can configure an interface port and Telnet to the router from a remote terminal.

Follow these steps to download (retrieve) the currently running configuration from a remote host:

Step 1 On the console terminal, the system prompt should display a pound sign (#) to indicate the privileged level of the EXEC command interpreter. If it does not, enter **enable**, and then your password, to get to the privileged level of the EXEC command interpreter.

Note Until you retrieve the previous configuration, the router will be running from the default configuration in NVRAM. Therefore, any passwords that were configured on the previous system will not be valid until you retrieve the configuration.

Step 2 Use the **ping** command to verify the connection between the router and the remote host.

Step 3 At the system prompt, issue the **configure network** (or **copy tftp startup-config**) command and press **Return** to enter the configuration mode and specify that you will configure the system from a network device (instead of from the console terminal, which is the default).

```
Router# configure network
```

Step 4 The system will ask you to select a host or network configuration file. The default is host; press **Return** to accept the default.

```
Host or network configuration file [host]?
```

Step 5 The system prompts you for the interface processor address of the host. Enter the interface processor address or name of the remote host (the remote file server to which you uploaded the configuration file.

```
IP address of remote host [255.255.255.255]? 1.1.1.1
```

Step 6 The system prompts you for the name of the configuration file. When uploading the file, the default is to use the name of the router with the suffix *-confg* (*router-confg* in the following example). If you specified a different filename when you uploaded the configuration, enter the filename; otherwise, press **Return** to accept the default.

```
Name of configuration file [router-confg]?
```

Step 7 Before the system reboots with the new configuration, it displays the instructions you entered for confirmation. If the instructions are not correct, enter **n** (no) then press **Return** to cancel the process. To accept the instructions, press **Return**, or **y** then **Return**.

```
Configure using router-confg from 1.1.1.1? [confirm]
Booting router-confg from 1.1.1.1: ! ! [OK - 874/16000 bytes]
```

While the router retrieves and boots from the configuration on the remote host, the console display indicates whether or not the operation was successful. A series of !!!! and [OK] (as shown in the preceding example) indicates that the operation was successful. A series of . . . and [timed out] or [failed] indicate a failure (which would probably be due to a network fault or an incorrect server name, address, or filename). The following is an example of a failed attempt to boot from a remote server:

```
Booting Router-confg ..... [timed out]
```

Step 8 If the display indicates that the process was successful, proceed to the next step.

If the display indicates that the process failed, verify the name or address of the remote server and the filename, and repeat the preceding steps. If you are unable to retrieve the configuration, contact your network administrator or refer to the end of this document for instructions on contacting technical assistance.

Step 9 Issue the **write term** (or **show running-config**) command to display the currently running configuration on the terminal. Review the display and ensure that the configuration information is complete and correct. If it is not, verify the filename and repeat the preceding steps to retrieve the correct file, or use the **configure** command to add or modify the existing configuration. (Refer to the appropriate software documentation for descriptions of the configuration options available for the system and individual interfaces and specific configuration instructions.).

Step 10 When you have verified that the currently running configuration is correct, issue the **copy running-config startup-config** command to save the retrieved configuration in NVRAM. Otherwise, the new configuration will be lost if you restart the system. This completes the procedure for downloading (retrieving) the configuration file.

Installing the RSP7000 Upgrade Kit

Following is a overview of the procedures for installing the RSP7000 upgrade kit in the Cisco 700 chassis.

RSP7000 Upgrade Kit Installation Overview

To install the RSP7000 upgrade kit, the following overview indicates the procedures that are required, after the router is powered down:

1. Turn off power to the chassis.

Caution To prevent system problems, turn off power to your chassis before proceeding with the RSP7000 upgrade procedures. The RP, SP (or SSP), RSP7000, and RSP7000CI do not support online insertion and removal (OIR), so power to the chassis must be turned OFF before attempting to remove or install these processor modules.

2. Remove the RP from slot 6 of the Cisco 7000 or slot 4 of the Cisco 7010.
3. Install the RSP7000CI in the 7000 CI slot of your chassis.
4. Remove the SP (or SSP) from slot 5 of the Cisco 7000 or slot 3 of the Cisco 7010.
5. Install the RSP7000 in the 7000 RSP slot of your chassis.
6. Power on the router for an installation check.

Removing the RP

Follow these steps to remove the RP:

Caution You must shut down the system before removing the RP, which is a required system component. Removing a RP while the system is operating will cause the system to shut down or crash and might damage or destroy memory files.

Step 1 Upload (copy) the currently running configuration file to a TFTP server so you can retrieve it later. (See the section “Saving and Retrieving the Configuration File” on page 11.)

Step 2 Slip on an antistatic strap and connect the equipment end of the strap to a captive installation screw on an installed interface processor, or to any unfinished chassis surface.

Step 3 Disconnect any devices that are attached to the console or auxiliary ports on the RP.

Step 4 Locate the RP in your chassis. The SP (or SSP) is installed in slot 5 in the Cisco 7000 (see Figure 8) or slot 3 in the Cisco 7010 (see Figure 9).

Figure 8 Cisco 7000 with RP and SP (or SSP) Installed

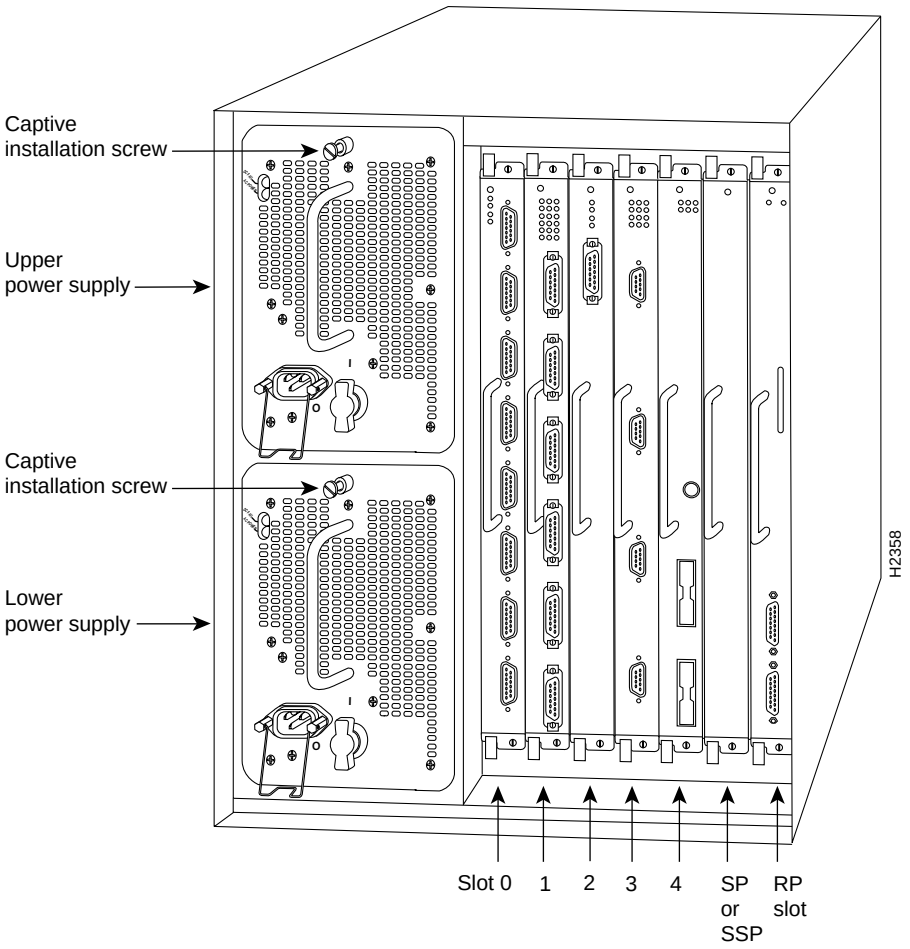
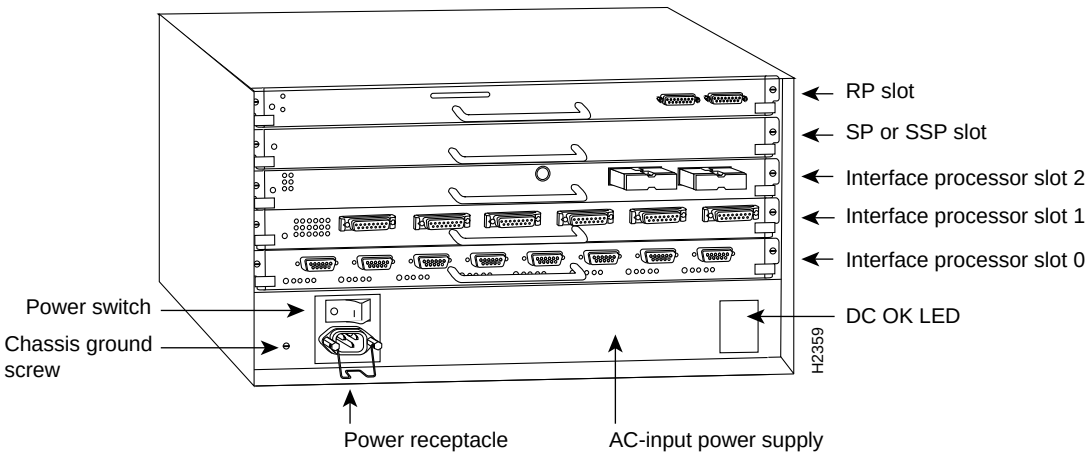


Figure 9 Cisco 7010 with RP and SP (or SSP) Installed



Step 5 Use a screwdriver (number 2 Phillips or 3/16-inch flat-blade) to loosen the two captive installation screws on the RP. (See Figure 5a on page 9.)

Step 6 Place your thumbs on the ends of each of the ejectors and simultaneously pull them both outward, away from the carrier handle (in the direction shown in Figure 5c on page 9) to release the carrier from the slot and to dislodge the RP from the backplane.

Step 7 Grasp the handle with one hand and pull the RP straight out of the slot, keeping your other hand under the carrier to guide it. Keep the carrier parallel to the backplane. Avoid touching the board or any connector pins.

Step 8 Place the removed RP on an antistatic mat or foam. If you plan to return the RP to the factory, immediately place it in an antistatic bag to prevent ESD damage.

This completes the RP removal procedure.

Installing the RSP7000CI

The RSP7000CI is keyed for installation only in the RSP7000CI slot (slot 6 in the Cisco 7000, see Figure 1, and slot 4 in the Cisco 7010, see Figure 2).

Note For proper card orientation during this installation, refer to Figure 6 for the Cisco 7000 or to Figure 7 for the Cisco 7010, both of which appear on page 10.

Caution To prevent damage to the chassis slot and to the connector on the RSP7000CI, do not attempt to install the RSP7000CI in any other slot but the chassis' 7000 CI slot. *Do not install the RSP7000CI in the router's Switch Processor (SP) slot.* You *must* install the RSP7000CI in the 7000 CI slot.

Follow these steps to install an RSP7000CI:

Step 1 Grasp the RSP7000CI handle with one hand and place your other hand under the carrier to support as you guide into the 7000 CI slot. Avoid touching the board or any connectors.

Step 2 Place the back of the RSP7000CI in the 7000 CI slot, and align the notches along the edge of the carrier with the grooves in the slot. (See Figure 5a on page 9.)

Step 3 While keeping the RSP7000CI parallel to the backplane, carefully slide the carrier into the 7000 CI slot until the RSP7000CI faceplate makes contact with the ejector levers, then *stop*. (See Figure 5b on page 9.)

Step 4 Using the thumb and forefinger of each hand to pinch each ejector, simultaneously push both ejectors inward (toward the handle) until they parallel to the faceplate. (See Figure 5c on page 9.)

Step 5 Use a screwdriver (number 2 Phillips or 3/16-inch flat-blade) to tighten the captive installation screws on the ends of the RSP7000CI. (See Figure 5a on page 9.)

Tighten the two captive screws on the RSP7000CI faceplate to prevent the RSP7000CI from becoming partially dislodged from the backplane and to ensure proper EMI shielding. (These screws must be tightened to meet EMI specifications.)

This completes the RSP7000CI installation procedure.

Removing the SP (or SSP)

Follow these steps to remove the SP (or SSP):

Caution You must shut down the system before removing the SP (or SSP), which is a required system component. Removing an SP (or SSP) while the system is operating will cause the system to shut down or crash and might damage or destroy memory files.

Step 1 Slip on an antistatic strap and connect the equipment end of the strap to a captive installation screw on an installed interface processor, or to any unfinished chassis surface.

Step 2 Locate the SP (or SSP) in the your chassis. The SP (or SSP) is installed in slot 5 in the Cisco 7000 or slot 3 in the Cisco 7010.

Step 3 Use a screwdriver (number 2 Phillips or 3/16-inch flat-blade) to loosen the two captive installation screws on the SP (or SSP). (See Figure 5a on page 9.)

Step 4 Place your thumbs on the ends of each of the ejectors and simultaneously pull them both outward, away from the carrier handle (in the direction shown in Figure 5c on page 9) to release the carrier from the slot and to dislodge the RP from the backplane.

Step 5 Grasp the handle with one hand and pull the RP straight out of the slot, keeping your other hand under the carrier to guide it. (See Figure 6 or Figure 7, depending on your chassis model.) Keep the carrier parallel to the backplane. Avoid touching the board or any connector pins.

Step 6 Place the removed SP (or SSP) on an antistatic mat or foam. If you plan to return the board to the factory, immediately place it in an antistatic bag to prevent ESD damage.

This completes the SP (or SSP) removal procedure.

Installing the RSP7000

The RSP7000 is keyed for installation only in the 7000 RSP slot (slot 5 in the Cisco 7000, see Figure 1, and slot 3 in the Cisco 7010, see Figure 2).

Note For proper card orientation during this installation, refer to Figure 6 for the Cisco 7000 and to Figure 7 for the Cisco 7010, both of which appear on page 10.

Follow these steps to install the RSP7000:

Step 1 Grasp the RSP7000 handle with one hand and place your other hand under the carrier to support as you guide it into the 7000 RSP slot in the following step. Avoid touching the board or any connectors.

Step 2 Place the back of the RSP7000 in the 7000 RSP slot, and align the notches along the edge of the carrier with the grooves in the slot.

Caution To prevent damage to the backplane, you must install the RSP7000 in slot 5 of the Cisco 7000 or slot 3 of the CIsco 7010. (See Figure 1 on page 2 or Figure 2 on page 3.) The slots are keyed for correct installation. Forcing the 7000 RSP into a different slot can damage the backplane and the RSP7000.

Step 3 While keeping the RSP7000 parallel to the backplane, carefully slide the carrier into the 7000 RSP until the RSP7000 faceplate makes contact with the ejector levers, then *stop*. (See Figure 5b on page 9.)

Step 4 Using the thumb and forefinger of each hand to pinch each ejector, simultaneously push both ejectors inward (toward the handle) until they parallel to the faceplate. (See Figure 5c on page 9.)

Step 5 Use a screwdriver (number 2 Phillips or 3/16-inch flat-blade) to tighten the captive installation screws on the ends of the RSP7000. (See Figure 5a on page 9.)

Tighten the two captive screws on the RSP7000 faceplate to prevent the RSP7000 from becoming partially dislodged from the backplane and to ensure proper EMI shielding. (These screws must be tightened to meet EMI specifications.)

Step 6 Connect the console terminal to the console port and any auxiliary devices to the auxiliary port on the RSP7000.

Step 7 Ensure that the console terminal is turned on.

Checking the Installation

Use the following sections to verify that the RSP7000 upgrade kit operates properly in your Cisco 7000 series router.

Formatting the Flash Memory Card

If you had a Flash memory card installed in the PCMCIA slot of your RP, you must reformat it if you want to use it with your new RSP7000. You cannot read data on the RP's Flash memory card, or use it as bootable media, unless you reformat it. Flash memory cards formatted on the RP-based systems (7000 series routers) are formatted differently from Flash memory cards formatted on RSP-based systems (7500 series and RSP7000-based routers).

Caution The formatting procedure erases all information on the Flash memory card. To prevent the loss of important data that might be stored on a Flash memory card, proceed carefully. If you want to save the data on a Flash memory card, copy the data to a server before you format the card, then retrieve the date after the card is reformatted.

Note Refer to the section "Saving and Retrieving the Configuration File" on page 11.

Use the following procedure to format a new Flash memory card:

Step 1 Insert the Flash memory card into Slot 0. (If Slot 0 is not available, use Slot 1.)

Step 2 To format the Flash memory card, use the **format slot0:** (or **format slot1:**) command as follows. (Use only Intel Series 2+ Flash memory cards.)

```
Router# format slot0:
All sectors will be erased, proceed? [confirm]
Enter volume id (up to 30 characters): MyNewCard
Formatting sector 1
Format device slot0 completed
Router#
```

Note For this example, an 8-MB Flash memory card was used, and at the line "Formatting sector," the system counted the card's sectors backwards from 64 to 1 as it formatted them. For 16-MB Flash memory cards, the system counts backwards from 128 to 1, and for 20-MB Flash memory cards, the system counts backwards from 160 to 1.

The new Flash memory card is now formatted and ready to use.

Checking the RSP7000 Installation

Use the following information to verify that the RSP7000 operates properly. When you turn the system power back on, verify that the system boots and resumes normal operation.

Perform the following steps to verify that the RSP7000 is installed and functioning properly:

Step 1 Check the RSP7000 connections to make sure they are secure:

- The RSP7000 is inserted all the way into the chassis' 7000 RSP slot (see Figure 1 on page 2 or Figure 2 on page 3), and that both of the captive installation screws are tightened.
- The console terminal is turned on and is connected to the console port.

Step 2 Observe the RSP7000 LEDs. While the system initializes, the yellow boot error LED on the RSP7000 stays on, then goes off when the boot is complete. As the RSP7000 initializes each interface processor, the status LEDs on each interface processor go on and off in irregular sequence.

Step 3 Verify that the console terminal displays the system banner and startup screen as the system restarts. The display should look similar to the following:

```
GS Software (RSP-K), Version 10.3(9), RELEASED SOFTWARE
Copyright (c) 1986-1995 by cisco Systems, Inc.
Compiled Wed 10-May-95

System Bootstrap, Version 5.3(9)

Current date and time is Sat 5-13-1995 21:38:35
Boot date and time is Thur 5-11-1995 15:32:28
[displayed text omitted from this example]
```

Step 4 After the system boots the software and initializes the interface processors (approximately 30 seconds for systems with 16 MB of DRAM, and approximately 2 minutes for systems with 64 MB of DRAM), verify that the RSP7000 LEDs are in the following states:

- RSP7000 normal LED is on
- CPU halt LED is off
- Boot error LED is off

Step 5 Verify that all the enabled LEDs (on the interface processors) are on.

When you have verified all the conditions in Steps 2 through 5, the installation is complete.

If you replaced the RSP7000 and saved your configuration file to a remote server before doing so, proceed to the section "Downloading (Retrieving) the Configuration File" on page 14. If you replaced the RSP7000 and did not save the configuration, use the **configure** command or the **setup** command facility to reenter the configuration information. Refer to the appropriate software documentation for command descriptions and instructions for using them.

An error condition exists if no LEDs go on at power up or after initialization, or if the boot error or CPU halt LEDs go on and remain on. If this happens, refer to the troubleshooting information in the *Cisco 7000 Hardware Installation and Maintenance* or *Cisco 7010 Hardware Installation and Maintenance* publication to try to isolate the problem, or contact a service representative for assistance.

This completes checking the RSP7000 installation

Checking the RSP7000CI Installation

Verify that the RSP7000 is installed in the chassis' 7000 RSP slot (see Figure 1 on page 2 or Figure 2 on page 3). Verify that the RSP700CI is installed in the chassis' 7000 CI slot (see Figure 1 on page 2 or Figure 2 on page 3), and that the captive installation screws on both processor modules are tightened.

Using the RSP7000CI and the temperature sensors on the RSP7000, the system displays warning messages on the console if chassis interface-monitored parameters exceed a desired threshold or if a blower failure occurs. You can retrieve and display environmental status reports with the **show environment**, **show environment all**, **show environment last** and **show environment table** commands. Parameters are measured and reporting functions are updated every 60 seconds. Use these **show** commands to verify that the RSP7000CI installation was successful. A brief description of each of these commands follows.

Caution To prevent overheating the chassis, ensure that your system is drawing cool inlet air. Overtemperature conditions can occur if the system is drawing in the exhaust air of other equipment. Ensure adequate clearance around the sides of the chassis so that cooling air can flow through the chassis interior unimpeded. Obstructing or blocking the chassis sides will restrict the airflow and can cause the internal chassis temperature to exceed acceptable limits.

The **show environment** command display reports the current environmental status of the system. The report displays parameters that are out of the normal values. No parameters are displayed if the system status is normal. The example that follows shows the display for a system in which all monitored parameters are within Normal range.

Following is sample output of the **show env** command:

```
Router# show env

All measured values are normal
```

If the environmental status is *not* normal, the system reports the worst-case status level in the last line of the display.

The **show environment last** command retrieves and displays the NVRAM log showing the reason for the last shutdown (if the shutdown was related to voltage or temperature) and the environmental status at that time. Air temperature is measured and displayed, and the DC voltages supplied by the power supply are also displayed.An example of the **show env last** command follows for both the Cisco 7000 and Cisco 7010:

```
RSP7000#sho env last
  CI(6) Inlet        previously measured at 22C/71F
    CI(6) Hotpoint     previously measured at 31C/87F
      CI(6) Exhaust      previously measured at 23C/73F
        +12 Voltage        previously measured at 12.12
          +5 Voltage         previously measured at 5.13
            -12 Voltage        previously measured at -11.84
              +24 Voltage        previously measured at 24.06

RSP7010#sho env last
  CI(4) Inlet        previously measured at 23C/73F
  CI(4) Hotpoint     previously measured at 35C/95F
  CI(4) Exhaust      previously measured at 25C/77F
  +12 Voltage        previously measured at 12.31
  +5 Voltage         previously measured at 5.17
  -12 Voltage        previously measured at -11.89
  +24 Voltage        previously measured at 23.78
```

The **show environment table** command displays the temperature and voltage thresholds for each of the three RSP7000 temperature sensors, for each monitored status level: low critical, low warning, high warning, and high critical. The slots in which the RSP7000 can be installed are indicated in parentheses (2 and 3). Also listed are the shutdown thresholds for the processor boards and power supplies. An example of the **show env table** command follows for both the Cisco 7000 and Cisco 7010:

```
RSP7000#sho env table
Sample Point      LowCritical    LowWarning     HighWarning
HighCritical
CI(6) Inlet                       44C/111F       50C/122F
CI(6) Hotpoint                    54C/129F       60C/140F
CI(6) Exhaust
+12 Voltage       10.90          11.61          12.82          13.38
+5 Voltage        4.61           4.94           5.46           5.70
-12 Voltage       -10.15         -10.76         -13.25         -13.86
+24 Voltage       20.38          21.51          26.42          27.65
2.5 Reference                    2.43           2.51
Shutdown power supplies at   70C/158F

RSP7010#sho env table
Sample Point      LowCritical    LowWarning     HighWarning
HighCritical
CI(4) Inlet                                     44C/111F       50C/122F
CI(4) Hotpoint                                  54C/129F       60C/140F
CI(4) Exhaust
+12 Voltage       10.90          11.61          12.82          13.38
+5 Voltage        4.61           4.94           5.46           5.70
-12 Voltage       -10.15         -10.76         -13.25         -13.86
+24 Voltage       20.38          21.51          26.42          27.65
2.5 Reference                    2.43           2.51
Shutdown power supplies at   70C/158F
```

The **show environment all** command displays an extended report that includes the arbiter type, backplane type, power supply type (AC or DC), wattage and status, the number and type of intermittent power failures (if any) since the system was last powered on, and the currently measured values at the RSP7000 temperature sensors and the power supply voltages. An example of the **show env all** command follows for both the Cisco 7000 and Cisco 7010:

```
RSP7000#sho env all
 Arbiter type 1, backplane type 70x0 (id 5)
 Power supply #1 is 700W (id 2), power supply #2 is removed (id 3)
 Active fault conditions: none
 Active trip points: none

                    0123456
            Dbus slots:  X   X

             card     inlet       hotpoint     exhaust
              CI(6)   21C/69F      30C/86F      22C/71F

              Shutdown temperature source is 'hotpoint' on CI(6),
              requested CI(6)

              +12V measured at 12.12
               +5V measured at 5.13
               -12V measured at -11.84
               +24V measured at 24.06
               +2.5 reference is 2.49
```

```
RSP7010#sho env all
 Arbiter type 1, backplane type 70x0 (id 5)
 Power supply #1 is 600W AC (id 1)
 Active fault conditions: none
 Active trip points: none

                      01234
            Dbus slots:  X X

             card     inlet       hotpoint     exhaust
              CI(4)   22C/71F      34C/93F      24C/75F

              Shutdown temperature source is 'hotpoint' on CI(4),
              requested CI(4)

              +12V measured at 12.31
               +5V measured at 5.17
               -12V measured at -11.89
               +24V measured at 23.78
               +2.5 reference is 2.49
```

If after several attempts, any component does not appear to be functioning properly, or if you experience trouble with the installation (for instance, if the holes in the board do not align with the backplane holes), contact a service representative or the Technical Assistance Center (TAC). (For the TAC phone number and email address, refer to the note at the end of this document.

This completes checking the RSP7000CI installation, and also completes the RSP7000 upgrade kit installation.

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This document is to be used in conjunction with the *Cisco 7000 Hardware Installation and Maintenance* and *Cisco 7010 Hardware Installation and Maintenance* publications.
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